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ABSTRACT

Apprehension about evaluating the use of computers in schools can be attributed to a variety of reasons, including the claim that evaluation discourages innovation and discovery. Powerful reasons, however, make evaluation at both regional and national levels desirable. By conceiving of evaluation as a formative, on-going process rather than as a summative process, it becomes possible to identify problems in a project from the start, allowing developers to take corrective action. Additionally, formative evaluation can provide generalizable data which may facilitate the implementation of similar projects elsewhere, thus reducing waste of time and money, an important consideration given the public's demand for accountability in education. Formative evaluation contributes to the validation process by making possible the establishment of a broader base of information which can be utilized to more reliably chart change and growth in programs. In fact, it can be a positive, helpful activity rather than a negative, judgmental activity if provision is made for effective communication about the goals of evaluation with staff members; the process is open to the emergence of unanticipated questions and to the discussion of program shortcomings; an external evaluator is employed; a system of regular reporting to program staff is included; and system goals for the use of computers are periodically clarified with program staff. Evaluations incorporating these guidelines are unlikely to stifle the energy and enthusiasm that are so critical in the innovation process. (GL)

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How Can We Assess "Dynamics and Vision?"

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Assessment of Educational Programs: How Can We Assess "Dynamics and Vision?"

by
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COMPUTERS IN EDUCATION: AN EXPLORATORY AREA

There is no doubt that computers in education offer exciting prospects. There is also no doubt that much of what is happening with computers in education is still at the exploratory level. Technological possibilities are continually expanding at the same time that access to sophisticated systems and software becomes more affordable. Teachers are being challenged to discover new opportunities for themselves and their students. In fact, the energy and enthusiasm of committed, visionary individuals is a powerful component of growth in the area of computer-related applications in education.

SHOULD WE BE THINKING ABOUT ASSESSMENT?

Clearly, we wish to nurture the growth and excitement that fuels so much of the work in computers in education. It seems, therefore, that assessing or evaluating computer use in your region or country is not a particularly appropriate suggestion at this point in time. Some reasons that are given for feeling this way include:

1. Evaluation will discourage innovation and discovery, in that it will apply some predetermined standard to a situation

2. Evaluation makes teachers in the process of growth and experimentation become uncomfortable or even disinclined to be innovative

3. How can we evaluate, when we are just experimenting, trying out new and different things?

4. We are not "far enough" into a project, or into computer use in general, to be thinking about evaluation. We should wait for two or three years until everything is set up and the project is running smoothly

5. Evaluation costs time and money which just aren't available, given all the demands involved with getting hardware and software in schools

6. We don't know how to go about doing this kind of evaluation. We have a "student assessment" branch but we have no procedure for trying to assess the impact of an innovation

7. The impact that computers are making on our students is important but subtle; for example, we don't expect to see changes in their "higher-level thinking for many years

8. We don't really need to "evaluate" the impact of computers in education; we can see that good things are going on, that a lot of activity is taking place, and that "the students love it."

All of these are reasonable explanations. In fact, so reasonable, that they are the case in most districts and countries. However, I would like to argue that there are some powerful reasons that make "evaluating" desirable, here and now, in the context of computer-related activity in schools. After I discuss these reasons, give some examples, and suggest some strategies for evaluating computer-related activity at the regional or national level, I would like to come back to these reasons for not evaluating. I submit that all of them, reasonable as they are, can be reconsidered.

THINKING ABOUT EVALUATION AS CONSTRUCTIVE INSIGHT INTO ONGOING ACTIVITIES

Many of the reactions people have to the process of "being evaluated" relate to evaluation used for summative, or judgmental purposes. With this type of evaluation, some conclusions are offered as to how well an activity has been conducted and has met its goals. However, there are other approaches to evaluation, one of which is the well known "formative evaluation." Formative evaluation works within an ongoing activity or system, and has as a major purpose the contribution of insights that can be used immediately by those within the system for refinements or adjustments in what they are doing.

There is a way of thinking about formative evaluation which is particularly helpful in situations involving computer-related activity. This approach involves a distinction between the logic of the assumptions of a situation and the actual activities that take place. When things do not go as one hopes, on a small or large scale, it may be that basic assumptions about the individuals involved, or the likelihood that certain actions will result in certain outcomes need to be reexamined. Or, it may be that it is only adjustments in the actual way of executing an activity that need to be made. Distinguishing between these two aspects can make a valuable contribution, both in an immediate fashion and also for longer-term planning. Let us look at some examples of this approach:

Applying Ongoing Evaluation to a New Project

Using telecommunications as an instructional tool is an exciting new idea in education. There are many projects throughout the world in which some exploration with telecommunications in the classroom is going on. A typical project involves a school in one country making contact with schools in two other countries to jointly produce a small newsletter. This sort of contact is expected to be good for the students--they will be more motivated to write because they will want to communicate with their new "colleagues," they will have a new and more effective way of learning about life in different cultures, and they will experience writing in a new context--as a social activity involving group discussions about content, editing, and clarity of expression. In addition, they will be developing a new set of computer-related skills, important because of the increasing importance of telecommunications in the workplace.

The typical project with these goals, however, encounters various difficulties, some technical, some "human". Most frequently, these are technical. However, other problems reoccur:

> What if one of the schools doesn't meet its deadlines, or doesn't send materials at all?
>
> What about different times for school vacations in different places,?
>
> What about different languages?
>
> What if only a few students seem to be doing all the communicating?
>
> What if there is a change in teachers at one of the schools and the new teacher doesn't feel comfortable handling the telecommunications process?

These and many other real problems have occurred at telecommunication projects that I have been asked to evaluate. A typical comment made to me in situations involving the first year of a project is, "Well, these are all predictable start-up problems. We will have the bugs worked out by next year." But unfortunately, a typical second-year situation is that the initial motivation for the project has subsided, some of the key people from the first year are no longer involved in the project, follow-up support and maintenance are not available in the way they were at the project onset because the starting-up of new projects is absorbing attention, and the project ceases to happen.

Very few of the many exploratory telecommunications projects going on throughout the world include systematic evaluation as part of the project from its start. Thus, variations on the pattern I have described above occur again and again. Very often no one is there to interpret what is going on, on an ongoing basis, in order to clarify a distinction between problems that relate to implementation decisions and those that relate more fundamentally to assumptions and logical planning. Although participants in a project are, of course, making continual interpretations about their problems, it is frequently helpful that an outside observer (or evaluator) work with them to identify their own assumptions and consider which of their difficulties relate to their implementation decisions and which to the logic of their prior

assumptions. Also, an evaluator can be responsible for ongoing, interpretive written comments about the project, extremely valuable to those beginning other similar projects in different settings. Strangely, this sort of ongoing trace of decisions is rarely available, and thus, collectively, we repeat "exploratory" projects over and over, without building on each others' experiences.

Examples of Other Situations Where Ongoing Evaluation Is Useful.

Ongoing formative evaluation can also be used to considerable advantage during educational software development projects. Rather than waiting for teacher evaluation of finished products, the evaluator can organize teacher reaction at various points during the conceptualization, design, and development phases, when feedback can make a more substantial impact on the product itself. Formative evaluation can make a helpful contribution to the delivery of information technology courses in schools, by providing an ongoing look at how such courses are actually being implemented in the classrooms. The distinction between plans for the courses and the impact of individual teachers and situations as the courses are implemented can provide a valuable dimension to the interpretation of the contribution of these courses. An evaluator can also provide a useful contribution through a midstream look at ongoing regional or national practice and policy, especially through identifying areas where communication of objectives, opportunities, and experiences is not occurring as effectively as those who are organizing the communication assume it is.

Advantages of an External Evaluator for Ongoing Evaluation

In each of these examples, all of which I have participated in as an external evaluator, there are particular advantages of working with an "informed outsider" as evaluator rather than only using individuals within the system.

-I have found that participants are more comfortable in identifying their problems and experiences with someone who is not the designer or deliverer of those experiences.

-An external evaluator can help to clarify assumptions operating within the system that those who are immersed in the system may not be aware of.

-The external evaluator can look at execution strategies in a somewhat more objective manner than can those involved in doing the execution. He can, for example, see the strategies separate from the personal characteristics of those who implement the strategies, a distinction that may not be as easy to see in reflecting about one's own activities.

-Goals and plans change continually in technology-related educational enterprises; those who are part of the ongoing evolution of these changes may not be aware of how far they have moved from the original intentions of an activity. The external evaluator, as an informed "historian", can ask questions about this evolution.

-The external evaluator, because he arrives at certain times rather than always being part of the situation, can serve as a catalyst to discussion and periodic reconsideration of goals and objectives. In the day-to-day implementation of overall regional or national practice, these sort of periodic considerations of goals and objectives can be quite valuable, particularly as such goals are frequently in the process of change and maturation themselves.

-Finally, as was commented on in the context of telecommunications projects, information synthesis between implementation sites with regard to computer use in schools does not occur well; too often we "reinvent the wheel", when we could benefit considerably in time, money, and ideas from being better informed about each other's experiences. A more wide-spread development of systematic formative evaluations at the regional and national level could make an information base about these experiences one step closer to being of use to individuals in other settings.

THINKING ABOUT EVALUATION BECAUSE SOONER OR LATER WE WILL HAVE TO

The examples I gave above showed contributions that can accrue to the region as well as to the field in general from the more systematic use of formative evaluation relative to computers in education. However, I believe there are other reasons why evaluation will more and more become part of the computers-in-education context, along with "dynamics and vision." There is increasing evidence that the period of public willingness to invest considerable portions of its educational budget on exploratory work in this area is evolving into a call for some kind of accountability. There is, after all, only so much time and money available to the overall educational system. We cannot expect the public to continue investing this time and money without some concrete evidence of "better educated" students.

So far, this evidence is not available in any generalizable form. Part of the reason the evidence is not available is lack of systematic efforts to assess or evaluate, for the reasons listed earlier in this paper. Another part of the reason, however, is that research that has been done is frequently criticized as highly flawed and, taken in combination, yields contradictory results.

I believe that we must, now, begin the process of developing better and more sensitive procedures for assessing the impact of the time and money we are committing to computer use in education, because soon society and its governments will require some evidence of this assessment from us. The United States Office of Technology Assessment, for example, has just completed a major study of computer use in education in the United States. An entire section of this report (one of the seven chapters) is focussed on the need for cost-effectiveness analysis as a basis for better decision making about public funding in education.

We cannot expect that, after ten years of computers in education in much of the Western world, we can keep getting funds for "vision" and "potential" if we cannot show some generalizable evidence that this vision can be translated into a payoff with high priority relative to our students. Reports from individuals describing their own experiences are not enough; taken in isolation, each report may reflect the personal characteristics of the individuals in the situation as much or more than it reflects the cost and time of computer involvement. Our arguments become much stronger, however, if we have a way to systematically evaluate and consolidate experiences over a broader area than the individual teacher, school, or project. The formative benefits of ongoing evaluation at the regional or national level can be augmented by the benefits that can come from the availability of a broader base of information in order to more reliably chart change and growth than is now possible.

SO, EVALUATION IS A GOOD IDEA, BUT HOW CAN WE BEGIN?

Providing the sort of constructive evaluation described here is as much an art as a science. This is both good news, in that formal and cumbersome procedures do not have to become institutionalized before valuable applications of formative evaluation can start. But it is "bad" news, in that it does not help the decision maker know where and how to begin. Here are some strategies that may help:

1. Communicate to your staff that formative, ongoing evaluation is a positive, helpful activity, not a negative, judgmental one. Also work to develop the attitude that it is a good and helpful thing to discuss experiences that have not gone as hoped, in order to learn from them.

2. Consider an approach to ongoing evaluation that systematically separates considerations about the premises and assumptions of a project from observations about the specific execution of a project.

3. Try to ask specific questions about the impact of what is being done with computers, but be open to the emergence of new questions. Encourage "brain-storming" over strategies to assess the questions. Sometimes just getting a good question is enough to better focus a staff on common goals.

4. Begin by trying to identify what you are using now as evidence that computers are making a positive contribution. Sometimes this evidence will be only at the level of, "Look at the smiles on the students' faces," but that is a good start. Keep track of the types of evidence that now influence your decision making about computers, and expect to see these change as your experiences mature.

5. Consider using an external evaluator who will make periodic visits to your situation to contribute different insights relative to your assumptions and the execution of your activities.

6. Disseminate the results of these reflections and of the work of the external evaluator in an informal but regular way throughout your system. This helps establish evaluation as a collegial exercise, not as a formal statement or judgment.

7. Periodically discuss the implicit and explicit goals that your system has for computers in education. All activities, evaluation or implementation, can develop more smoothly if staff share a sense of goals and vision. In our rapidly growing field, this vision will continually be changing; therefore regular, informal, discussion about goals is valuable. An external evaluator can stimulate this discussion.

WHAT ABOUT THE "GOOD REASONS" WE HAVE FOR NOT EVALUATING COMPUTER-RELATED ACTIVITY?

At the start of this presentation, we identified eight common, and reasonable, reasons that decision makers in education frequently give for not systematically implementing ongoing evaluation with respect to computer use in their systems. Let us reexamine these reasons.

The first four can be dispelled if we stop thinking of evaluation as summative and judgmental, and instead see it as a positive contribution to the better understanding of what is going on at the moment. The logic and assumptions of an activity can always be discussed, even if the assumption is no more specific than "Exploration is good for education" and the project is only beginning.

The fifth point is based on an assumption that "an evaluation" requires an extensive enterprise, thus costing time, money, and burden on a system. The type of evaluation I am suggesting as most helpful for emerging computer use in education can be approached on a small and personal scale and still have value. The costs of inviting an external evaluator in for two- or three-day discussions, once or twice a year, can be more than repaid in terms of input for more effective decision making in the system.

The next two points remain serious objections. We don't know how to "measure" the impact on computer use on our students. Maybe this impact will only show up many years in the future; maybe we don't have sophisticated enough strategies to capture what is already going on. However, because these are problems doesn't mean we can ignore them. We are making implicit assessments all the time about computer use in our schools, and these judgments and assessments underlie our decisions to spend more money and other resources on this use. We should, at least, come to a better understanding of what motivates our current decision making, but more than this, I believe we will eventually have to have more professional strategies for cost-benefit analysis in this area. The time to start development of these strategies is now, before we are forced to impose them.

The last point on the list of reasons to postpone systematic evaluation efforts was the assumption that we really don't need evaluation in the area of computers in education at all, that we "know" it is good and that good things are happening. I share this belief that "good things" are happening; however, I want to make those "good things"

more widely available to other students. I think that this will occur more efficiently and effectively than it does now if we analyze our vision so that we can better identify things that can thwart its momentum. Yes, there are many good things going on with computers in schools, but I believe that much more could be happening, given the resources that are already available. I think ongoing, positive, formative evaluation can be a "productivity tool" and I urge you to consider including it now in your systems. The co-relation of ongoing evaluation and "dynamics and vision" can be one of mutual value.